



McCullough's Creek Hydropower Scheme, Whataroa, West Coast.

Landscape Assessment Report_Rev5

Bernie Ranum, 27 March 2019

To be read in conjunction with:

- *Appendix A (RevB)_ McCulloughs Creek Hydropower Scheme, Whataroa, West Coast.*

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1. INTRODUCTION

1.1. Overview

The following Landscape Assessment has been prepared by Bernie Ranum, Landscape Architect of Resilio Studio, for No.8 Limited as part of their Department of Conservation Concession Application to construct a hydropower scheme at McCullough's Creek, Whataroa. This assessment takes into account the feedback received from the Department of Conservation peer review undertaken by Jeremy Head, Landscape Architect, of the McCullough's Creek Hydropower Scheme Visual Impact Assessment Report (March 2018). The initial report focused on the visual impacts of the scheme, while this report assesses both changes to the visual landscape (visual impacts) and changes to the physical landscape character (landscape effects) and is considered to have addressed the concerns raised in the peer review.

1.2. Executive Summary

This Landscape Assessment provides professional analysis and commentary on the potential landscape and visual effects of a proposed hydropower scheme located at McCulloughs Creek, Whataroa, on the West Coast of the South Island. The scheme is situated within the Whataroa Scenic Reserve, Waitangi Forest Conservation Area and McCulloughs Creek Marginal Strip. McCulloughs Creek extends from the southwestern flank of the Adams Mountain Range to the edge of the Whataroa River Valley and into the Whataroa River. The proposal involves the construction and operation of a 1,890 kW Hydro power scheme on McCulloughs Creek; a narrow fast flowing alpine gully stream located within a steeply incised and densely vegetated gully containing indigenous forest cover.

The scheme proposes to install a weir and intake structure in the upper reaches of the creek, approximately 520m above sea level, diverting water via a penstock pipeline to a powerhouse located in its lower reaches, at around 120m above sea level.

The proposed penstock corridor traverses the natural slope of the valley and will allow access on foot via a route along the length of the penstock alignment. A 'route' is defined in SNZHB8630 as *'Generally unformed lightly cut route catering for the most experienced of backcountry visitors. Routes follow the lie of the land and are not formed.'*¹ The route will not involve structures, lookouts, signs, or track formation, however there would likely be a marked line formed naturally from walking. Installation of the penstock pipe and associated route will involve some vegetation clearance, however the proposed construction methodology seeks to avoid the removal of any significant trees by coordinating with a

¹ SNZ HB 8630:2004 New Zealand Handbook Tracks and Outdoor Visitor Structures. October 2003

project ecologist to identify on site the most appropriate route to avoid significant trees, and to limit tree removal to those with trunks less than 30cm diameter at breast height (dbh).² The HDPE plastic penstock pipe will be HDPE welded together and pulled along the ground through the forest track with winches and cables meaning this section of penstock can be installed without the use of steel lattice towers and cableways.

Temporary steel lattice towers and cableways will be built to service the installation of the GRP/Steel section of the penstock alignment. This section will be installed and removed by helicopter, minimising the impact of construction activity on the natural environment. Once construction is complete, indigenous vegetation will be allowed to regenerate in areas not used by the scheme.

The intake weir, penstock pipelines and powerhouse will be permanent structures of the scheme introduced into a natural landscape. The powerhouse will be accessed by a gravel vehicle access track off Whataroa Highway (SH6), which will appear similar to existing farm tracks found in the local area. The gravel access track to the powerhouse and the route along the penstock alignment will both remain accessible after construction to those familiar with their locations, for example DOC staff, hunters and backcountry hikers.

While the intervention is relatively minor in comparison to the scale of the catchment and the broader Whataroa River Valley landscape, the introduction of permanent structures into an otherwise natural landscape may alter an individual's perception of the landscape as an untouched, natural environment. However, once vegetation removed as a result of the implementation of the proposal has regenerated and the ongoing visual effects from publicly accessible areas are limited to the vehicle access track, the perception of this area as an altered landscape will be limited to those who know of the existence of the proposal and associated structures and the very limited audience who may encounter the various elements of the proposal.

Site visits were undertaken by the project team to photograph representative viewpoint locations, to analyse landscape character and to ground truth photos of viewpoints taken by local photographer Petr Hlavacek in February 2018. Site visits by Bernie Ranum of Resilio Studio were carried out on 11, 12 and 13 February 2019, which involved a two hour hike up McCulloughs Creek starting at the proposed powerhouse location, a three hour hike along the proposed penstock alignment and a helicopter flight from Whataroa up the McCulloughs Creek gully to the weir intake site. Photomontage views of the proposed scheme set within the landscape context were developed and are included in the appendix to this document.

² *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

The conclusion of this Landscape Assessment is that due to the scale and nature of the proposed development, the construction methodology used for the temporary and permanent structures; the weir and inlet structures, penstock and associated access track, gravel vehicle access, support towers and cableway; and the minimisation of any vegetation removal, there will be moderate-low landscape and visual effects during construction and low to very-low landscape and visual effects following construction.

Methodology

The following methodology was adopted in the preparation of this Landscape Assessment:

- Desktop assessment of the development proposal, statutory context and likely locations of representative viewpoints.
- Review and analysis of the following documents:
 - Ecological Assessment (EA) for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland, prepared by Wildlands Consultants Ltd.³
 - McCulloughs Creek Hydropower Project, Whataroa. Environmental Impact Assessment (EIA) in support of No.8 Limited Department of Conservation Concession Application, prepared by No. 8 Ltd.⁴
 - McCulloughs Creek Hydropower Scheme Supplementary Ecology Report, prepared by Ecology New Zealand.⁵
- CAD / 3D modelling of project components to assist in the production of photomontages at representative viewpoint locations.
- Project site visit:
 - To observe landscape character and values;
 - To assess the extent and scale of the proposed development, potential landscape and visual effects, visual catchment, viewing audience and possible mitigation strategies; and
 - To ground-truth existing viewpoint locations and take additional representative viewpoint photos.
- Preparation of draft Landscape Assessment Report, including photomontages of the proposed development.
- Preparation of final Landscape Assessment Report.

³ Hutchison M, McCaughan H, Patrick B. *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

⁴ Kent-Johnston J. *McCulloughs Creek Hydropower Project, Whataroa. Environmental Impact Assessment in Support of No.8 Limited - Department of Conservation Concession Application. No.8 Limited; 2017*

⁵ Choromanski M, Whiteley C. *McCulloughs Creek Hydropower Scheme Supplementary Ecology Report. Ecology New Zealand; 2018*

2. SITE CONTEXT AND LOCATION

2.1. Regional Context

The proposed scheme is located within a stretch of McCulloughs Creek, a tributary of the Whataroa River in the Westland District of the South Island. McCullough Creek flows from the south western flanks of the Adams Ranges, part of the central Southern Alps, down a deeply incised gully immediately to the east of the Whataroa River Valley, near the township of Whataroa, approximately 15 km from the West Coast of the South Island.

2.2. Local Context

The Whataroa River Valley is a large enclosed alluvial plain that spans approximately 10 km across from east to west and 15 km from north to south. The Whataroa River is a braided river system that flows in a northwesterly direction toward the Tasman Sea, through pastureland flats and swathes of indigenous vegetation that reveal the underlying river valley flood patterns.

Present in the Whataroa River Valley are distributed farm houses, farm buildings, shelterbelts, specimen trees, roads, power lines and farm tracks, small lakes, lagoons and wetland areas. Whataroa Highway (SH6) traverses the edge of the river valley, passing 500 metres to the west of the site.

The surrounding mountains are covered in dense native forest which ranges from Kamahi forest on the steep slopes, to stands of rata of similar ages on spurs, and scattered rimu emergent on slopes in the south and scrub and young forest on recent flats, stream beds.⁶

McCulloughs Creek flows from alpine sources, through a steep subalpine section, dropping rapidly over a series of waterfalls and rapids to around 100 metres above sea level where it then flows through gently-sloping land for around a kilometre and a half to the confluence with the Whataroa River.

Features and characteristics of the local landscape were ground truthed on site by Bernie Ranum during the site visit in February 2019. Photos were taken at the following sites to help gauge the likely visual impact on the potential viewing audience; local residents and tourists in moving vehicles, local farm residences, cycle tourists and recreational users of the river:

⁶ Hutchison M, McCaughan H, Patrick B. *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

- Along SH6 adjacent to the site to the west and southwest
- At the eastern end of Whataroa township
- At the lower reaches of McCulloughs Creek on the western side of SH6
- At the Whataroa River near the confluence with McCulloughs Creek
- Along Burrough Road

2.3. The Site

The proposed scheme traverses through the McCulloughs Creek catchment, which for analysis of the landscape and visual effects can be categorised into three sections based on their location relative to the scheme components:

- The upper catchment (above the intake weir).
- The central catchment (between the intake weir and powerstation).
- The lower catchment (below the powerstation).

Refer Appendix A - sheet A3 (Landscape Context) for a plan of the above sections in relation to the proposed development overlaid on an aerial photograph.

The upper catchment begins within a subalpine zone with a peak at around the 1870 metre contour, extending down to just above the intake site at the 520 metre contour. No part of the proposal occurs in the upper catchment.

The central catchment begins at the intake site at the 520 metre contour and extends down to the powerhouse site at the 120 metre contour. This catchment contains the penstock corridor and associated access route, which traverses the southern ridge of the gully from the intake weir to the powerhouse, as well as the support towers and cableway.

The landscape at the intake site is characterised by a steeply incised gully surrounded by dense native forest and indigenous riparian vegetation, dominated by grasses, sedges, and herbs, with occasional ferns and tree seedlings and shrubs.⁷ This site has near vertical rock walls, a fast flowing creek with several large waterfalls and rapids, characterized by large boulders, cobbles and gravel, with very clear, fast-flowing water forming mostly cascades and pools. Exposed rocks and boulders are scattered amongst bush tussock throughout the gully floor and within the creek bed.

The landscape is characterised by steep sloping hillsides of indigenous podocarp-hardwood forest. The creek is surrounded on both sides by steep banks, often vertical in places, which

⁷ Hutchison M, McCaughan H, Patrick B. *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

obscure the view of the creek bed from the surrounding gully slopes. The vegetation along the penstock alignment is dominated by kamahi, with southern rata in the upper part of the catchment, and emergent podocarps, kahikatea, miro and rimu in the lower part of the catchment.⁷ Thickets of supplejack are common in this catchment, which made traversing the penstock alignment extremely difficult due to the almost impenetrable tangles formed along large sections of the route. A number of recent landslips were evident along the central catchment, both from the air and when traversing the creek on foot, with debris scattered amongst rocks and boulders along the creek bed.

The lower catchment is located below the powerstation at the 120 metre contour and includes the McCulloughs Creek marginal strip and the gravel access track. At the powerhouse location the creek is surrounded by indigenous riparian forest with a fairly open understorey. The gully flattens out from around the 100 metre contour and the creek flows at an even grade with a typical riffle-run-pool sequence occurring as it passes through a marginal strip with a dense riparian edge, before it reaches the confluence with the Whataroa River. The lower catchment contains pastureland and indigenous riparian forest dominated by tree tutu and includes other species such as pate, wineberry, tree fuchsia/kotukutuku and pigeonwood.

In summary, the scheme spans a steeply incised mountain gully creek on the western slopes of the Mount Adams Range, through steep hillsides of indigenous podocarp-hardwood forest, and has an access track within a riparian margin in a low alluvial plain in the rural landscape of the Whataroa River Valley.

Refer Appendix A - sheet A1 (Site Location), sheet A2 (Whataroa Regional Landscape Context), sheet A3 (Landscape Context), sheet A4 (Site & Layout Plan), sheets A6 (Local Area) & sheet A7 (Site Photos) for a selection of photos demonstrating the above elements and characteristics.

3. STATUTORY CONTEXT

3.1. Reference documents

The proposed project is located on public conservation land in Whataroa Scenic Reserve, Waitangi Forest, and McCulloughs Creek Marginal Strip, which are all administered by the Department of Conservation. The relevant planning and resource consent documents in relation to the assessment of landscape and visual effects for this proposal are:

- Resource Management Act 1991 (RMA);
- Conservation Act 1987 (CA)

- Conservation General Policy 2005 (CGP)
- Reserves Act (RA)
- West Coast Regional Policy Statement (WCRPS)
- West Coast District Plan (WCDP)
- West Coast Management Strategy (CMS) 2010 - 2020 (CMS)

Refer Appendix A - sheet A5 (Planning / Landscape Overlays)

3.2. Resource Management Act

Part II (Purposes and Principles) of the Resource Management Act 1991 (RMA) addresses landscape considerations. Section 6 (Matters of national importance) stipulates that all persons exercising functions and powers under the Act shall recognise and provide for:

(a) "the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development."

The intake weir and sections of the penstock pipes, foot access route and cableway will be located above 300m above sea level, passing through an area identified in the Westland District Plan as an Outstanding Natural Landscape (ONL). Regard should therefore be given to the clauses identified above.

3.3. Conservation Act

The Conservation Act (CA) has been developed *"to promote the conservation of New Zealand's natural and historic resources"*.

The access track along McCulloughs Creek is located on land zoned marginal strip. It is therefore appropriate to give consideration to Part 4A - Marginal Strips of the CA. The sections relevant to this LVA are:

24C Purposes of marginal strips

Subject to this Act and any other Act, all marginal strips shall be held under this Act -

(a) for conservation purposes, in particular -

(iv) the protection of the marginal strips and their natural values.

3.4. Conservation General Policy

The general policy has been prepared under section 17 of the Conservation Act to provide a unified policy for the implementation of relevant acts listed within the 1st schedule of the Conservation Act.

Policy 4.5 - Geological features, landforms and landscapes is particularly relevant to the proposed scheme.

4.454 Policy 4.5 (b) states that *“Activities which reduce the intrinsic values of landscape, landform and geological features on public conservation lands and waters should be located and managed so that their adverse effects are avoided or otherwise minimised”*.

Intrinsic value is defined in the CGP as: *“A concept which regards the subject under consideration as having value or worth in its own right independent of any value placed on it by humans”*.

Avoidance of adverse landscape and visual effects during and after construction of the proposed scheme will require careful planning, design and management to protect the McCulloughs Creek and surrounding environments ‘intrinsic value’.

3.5. The Reserves Act

The Reserves Act (RA) has been developed *“to make further provision for their acquisition, control, management, maintenance, preservation (including the protection of the natural environment), development, and use, and to make provision for public access to the coastline and the countryside”*.

The encroachment of the proposal into the Scenic Reserve means that it is appropriate to give consideration to Section 19: Scenic Reserves.

Section 19: Scenic Reserves

(1) It is hereby declared that the appropriate provisions of this Act shall have effect, in relation to reserves classified as scenic reserves

(a) for the purpose of protecting and preserving in perpetuity for their intrinsic worth and for the benefit, enjoyment, and use of the public, suitable areas possessing such qualities of scenic interest, beauty, or natural features or landscape that their protection and preservation are desirable in the public interest;

(2) It is hereby further declared that every scenic reserve classified for the purposes specified in subsection (1)(a) shall be so administered and maintained under the appropriate provisions of this Act that

(a) except where the Minister otherwise determines, the indigenous flora and fauna, ecological associations, and natural environment and beauty shall as far as possible be preserved, and for this purpose, except where the Minister otherwise determines, exotic flora and fauna shall as far as possible be exterminated.

3.6. West Coast Regional Policy Statement (WCRPS)

The character of the McCulloughs and Whataroa landscape determine that it is appropriate to give regard to Chapter 6 - Heritage; and Chapter 9 - Habitats and Landscape of the WCRPS.

Chapter 6 - Heritage

Objective 6 of the WCRPS aims *“to avoid, remedy or mitigate actual or potential adverse effects of resource use, development or protection on heritage and archaeological sites and values that contribute to the West Coast’s distinctive character and sense of identity.”*

Heritage Policy 6.1 aims to *“Promote the identification and protection of heritage values of the region”*, which include:

c) Places or areas of intrinsic, recreational or amenity value or of visual appeal.

Chapter 9 - Habitats and Landscape

Chapter 9 of the WCRPS (Habitats and Landscapes) indicates that, due to their inclusion in the Department of Conservation estate, most of the outstanding natural features and landscapes on the West Coast are already afforded adequate protection, however the WCRPS also identifies adverse effects on the natural character of outstanding natural features and landscapes arising from subdivision, use, and development as relevant issues relating to the Region.

3.7. Westland District Plan (WDP)

The introduction to the Westland District Plan outlines the Council’s vision for the district, with features of the district including *“a distinctive and internationally recognised dramatic coast-to-alpine environment and vistas which are accessible for the enjoyment of both inhabitants and visitors.”*

Section 3.10 – Landscapes

The key objectives of Section 3.10 are as follows:

Objective 3.10.1 - *To ensure development does not impinge on the integrity of landscapes in Westland.*

Objective 3.10.2 - *To maintain and protect the existing scenic and open and diverse character of Westland District, dominated by natural dynamic processes.*

Objective 3.10.3 - *To ensure that land uses, buildings and development have regard to the natural landscapes in which they are located or seek to be located.*

In seeking to protect and manage the distinctive landscapes which are characteristic of the Westland District, the WDP does not describe the process for deciding which natural features and landscapes are outstanding. However, the Plan does provide examples of outstanding landscapes within the district to help determine what could be considered “outstanding”. Land above 300m is included in the listed examples of outstanding natural landscapes.

Section 4.8 - Landscapes Policies

The WDP has the following landscape policies:

Policy A - *The continuity of the mountains to sea landscape in Westland particularly in the south of the District and significant landscape elements shall be protected by ensuring development takes into account the landscape setting.*

Policy C - *Council will protect significant landscape areas, including natural features, in the District.*

3.8. West Coast Management Strategy (CMS)

The West Coast Tai o Poutini Conservation Management Strategy (CMS) presents objectives and policies to manage the natural, historical and cultural heritage values and recreational opportunities within its conservancy.

In regards to the proposed scheme section 3 outlines the objectives and policy of Natural Heritage Conservation, particularly 3.3.4 ‘Geodiversity and Landscapes’, and subsection 3.3.4.3 ‘Management of Geodiversity and Landscapes’ are most relevant to the landscape values of the area and the management of them. These sections of the CMS, imply that geodiversity is an inherent component of natural landscapes, and are the visual expression of the cultural, physical and biological processes operating in the environment.

Objectives and policies refer principally to the protection and interpretation of landscape values and landform, geological and soil features.

Objective 1 - To protect geodiversity and landscapes from adverse effects of human use or management. To achieve this policy this section of the CMS articulates this through a number of policies. Those relevant to the application include policies 1,2, and 4.

1. *The Department should seek to protect and preserve the natural character, integrity and values of landscapes, landforms, geological and soil features and processes in all aspects of conservation management.*

2. *Landscape assessments should be conducted on an as-needed basis, e.g. when considering proposals to develop utilities on public conservation land.*

4. *The development of landscape assessment methodologies to take account of viewfields and the mountainous backdrop of the Conservancy may be promoted, and this information made available for assessment of new proposals, particularly proposals for the construction of utilities, infrastructure or other buildings.*

The construction of the proposed scheme will be required to apply a unified approach to mitigating potential adverse impacts or changes to the landscape during and after construction.

4. PROPOSED SCHEME

4.1. Proposed Development Overview⁸

The proposal for the 1,890 kW McCulloughs Creek Hydropower Project will divert water from McCulloughs Creek approximately 520 metres above sea level and direct it through approximately 2,700m of above ground penstock pipelines to a powerhouse located approximately 120 meters above sea level, after which the water will be returned to McCulloughs Creek via a concrete discharge tailrace through several discharge points.

The site will be accessed via a gravel access track from Whataroa State Highway. During the construction phase, support towers and cables will be installed and laydown areas for construction material will be created for the GRP / Steel penstock alignment. Construction materials required for the intake weir, penstock pipelines and cableway will be brought in to site by helicopter.

As part of the construction, a foot access track will run alongside the penstock pipe alignment. The type of track is proposed to be low impact in the style of a DoC 'route' as defined in SNZHB8630.⁹ This track will enable easier access into Whataroa Scenic Reserve and Waitangi Forest for pest animal and weed control, ecological monitoring, and for local enjoyment.

⁸ Refer to *McCulloughs Creek Hydropower Project, Whataroa. Environmental Impact Assessment for a detailed description of the proposal and its components*

⁹ SNZ HB 8630:2004 *New Zealand Handbook Tracks and Outdoor Visitor Structures. October 2003*

Although the exact locations of the scheme components; access road, cableway, penstock pipeline and associated foot access route, intake weir, desander, powerhouse and tailrace; are to be confirmed on site, any variation will not substantially affect the landscape and visual effects of the proposal for the purposes of this report.

The scheme involves taking 600 litres per second (l/s) of water from McCulloughs Creek at the intake weir and returning it to the same creek at the powerhouse. The Mean annual low flow (MALF) for the stream was calculated as 250 l/s, while the average flow is estimated to be 1,100 l/s.¹⁰

The visual effect of the reduction of water flow due to the scheme, for the section of the creek between the intake weir and powerhouse, would be virtually imperceptible to an individual traversing the creek as it there is a wide range of normal flows and the flow when the scheme is operational in that section of creek will sit within that natural variability.

For the purposes of the photomontages used to inform the landscape and visual effects assessment, only those elements visible from Whataroa Highway SH6 are considered, as outlined in the table below:

Component	Description	Colour
Access Alignment	3.5 m wide unsealed, gravel access track.	Grey/black
Powerhouse	Steel 2 car garage	Black/grey
Penstock Pipe	HDPE Plastic	Black matt
Penstock Pipe	Glass Reinforced Plastic	Black
Penstock Pipe	Steel	Black/grey
Cableway: Support Tower; Laydown Area; Cable and Clamp (removed after construction)	Galvanised steel, steel cable, steel	Grey

4.2. Project Components Overview

The following section briefly describes each component of the proposed project and outlines the construction details that could affect the integrity of the landscape, chronicled from the upper site (intake) to the lower site (powerhouse). The rationale for the selection of site and

scheme components and their relative locations, as well as site access, is explained in more detail in the EIA.¹⁰

In addition to Appendix A - sheet A4 (Site & layout Plan) see also sheet A8 (Proposed Development Components) and Sheet A9 (Proposed Development Cross Section).

4.3. Central Catchment - Weir Intake, Desander, Helipad and the Penstock Pipeline Corridor.

The majority of the permanent works for the proposal occur in the central / mid-catchment; the Weir Intake, Desander, Helipad and the Penstock Pipeline Corridor.

The intake will be a concrete overflow weir with a steel coanda screen and steel 'grizzly bars'. Coanda screens allow for water to free flow through while fish and debris pass over, and grizzly bars protect the integrity of the infrastructure and deflect rocks, trees and other debris from blocking the flow of the river mitigating potential damage and adverse impacts of flooding on the surrounding landscape. A desander will be constructed above the river banks using similar methodology to the weir intake, utilising concrete and steel components.

Civil works would be constructed in the dry and keyed into the natural rock on site, utilising as much of the natural riverbed as possible. This technique is to reduce the size of the concrete structures and reduce its visual impact.

It is proposed a helicopter will be used to transport equipment into the upper site. Construction of a helipad will be necessary to transport construction materials into the site to achieve minimal impact on the landscape. Existing river gravels in McCulloughs Creek are proposed to be utilised for construction of both the intake and helicopter landing pad.

Excavation of a clear site and processing of these gravels may present an adverse effect on the landscape and will require sensitive management. To mitigate the impact of excavation the applicant proposes to use excess rock in their concrete mix and use larger boulders for placement on the downstream faces of the weir. It is also stated in the EIA, that the *"helicopter landing areas will be removed and the areas left to regenerate from local seed sources."*¹¹

The intake site, desander and helipad will introduce changes to the landscape character of the upper catchment around the intake site, however, the applicant proposes a number of

¹⁰ Kent-Johnston J. McCulloughs Creek Hydropower Project, Whataroa. Environmental Impact Assessment in Support of No.8 Limited - Department of Conservation Concession Application. No.8 Limited; 2017

¹¹ Kent-Johnston J. McCulloughs Creek Hydropower Project, Whataroa. Environmental Impact Assessment in Support of No.8 Limited - Department of Conservation Concession Application. No.8 Limited; 2017

techniques to mitigate the landscape and visual effects. After construction is complete, with the helipad removed, the visual effects of the remaining intake site and desander will be limited to a small section of creek, as the steep banks adjacent to the creek obscure the creek bed from the surrounding gully slopes. The potential viewing audience would therefore be limited to experienced backcountry hikers or hunters who have traversed the length of the creek to the intake site, which is approximately a 4-5 hour hike.

Approximately 2,700m of above ground penstock pipelines will be installed between the intake weir and powerhouse. The penstock pipes are in three parts; a 625 mm diameter high-density polyethylene (HDPE) pipe which will run for approximately 1,800 metres from the intake to the primary ridgeline before it tapers to a 550 mm diameter glass fibre reinforced plastic (GRP) pipe and runs down the ridge for approximately 550 meters toward the powerhouse. At 300 metres from the powerhouse the penstock pipe tapers to a 475 mm diameter steel pipe. The HDPE penstock in the upper section is laid flat on the finished ground/track. In the high pressure GRP and steel section, the pipeline is placed on supports 12 metres apart with 0.75 meters wide thrust blocks at vertical and horizontal bends. The use of flexible piping materials in addition to them being constructed in 12 metre sections enables manoeuvrability and will assist in the avoidance of significant trees and their root zones across the pipeline corridor.

The proposed width of the penstock footprint is 2.0 metres during construction and 1.5 metres during operation. A permanent 0.75 metre wide foot access track, similar to a typical Department of Conservation 'route' will be created along this alignment for construction and ongoing operation, including maintenance of infrastructure.

The access track will also provide public access to Whataroa Scenic Reserve and Waitangi Forest. Understorey vegetation would be removed to construct the access track but would be encouraged to regenerate post-construction. The surface of the track would be left in a natural state and not require formation through means such as scraping or benching.

Construction of the penstock pipeline corridor will require some permanent clearance of indigenous forest along a two metre-wide corridor. As recommended within the Wildlands EA, the alignment of this pipeline will be refined during installation under the supervision of an experienced ecologist and arborist.¹² The selection of trees which need to be pruned or felled will be professionally and individually recommended based on multiple factors such as threat status, structural integrity and fauna habitat.

¹² *Hutchison M, McCaughan H, Patrick B. Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

In addition the EIA states that a large corridor along the penstock alignment will not be necessary, a track of 1.5 - 2m will be the minimum area required providing 1.0m - 1.3m for construction and temporary access. Operational management of the pipeline is proposed to be 0.75m wide track, allowing the excess shoulder and laydown areas to naturally regenerate. These management practices assist the mitigation of potential adverse landscape and visual impacts vegetation clearance could have on the dense indigenous vegetation.

4.4. Central Catchment - Temporary Cableway, Support Towers and Laydown Areas.

A temporary aerial cableway will be constructed through the forest from the powerhouse up the ridgeline to an elevation of approximately 360 metres above sea level. The cableway will be used to carry construction materials and equipment along the pipeline/penstock at a walking pace (0.5 m/s – 1 m/s) both for safety reasons and also as it requires a narrower corridor of vegetation to be removed. Construction laydown areas will be created at the support towers. This will require the clearance of 100m² of non-canopy vegetation at the lower site and 50m² at the upper site.

The proposed support towers are 5m - 10m tall, which is a similar height to the surrounding forest canopy. The canopy will therefore likely obscure parts of the view of the cableway towers and laydown areas from SH6. The towers will be painted in a dark colour palette assisting in mitigation of their visual impact during construction.

The EIA states the cableway and lattice towers will be removed by helicopter post construction, enabling natural regeneration of the original landscape. The Wildlands EA states that *'Restoration planting is not required following removal for the construction laydown material; the indigenous vegetation will be left to regenerate naturally from local seed sources, as this will ensure that ecologically inappropriate species are not introduced to the project area'*.¹³

Statements within both the EIA and the SEA recommend the support towers and cableway will be installed and removed with a professional ecological approach, sensitively removing or pruning vegetation to assure minimal canopy gaps. These statements suggests the proposed scheme will address any potential adverse effects on the landscape of the cableway.

4.5. Lower Catchment - Powerhouse.

¹³ Hutchison M, McCaughan H, Patrick B. *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands; 2017*

There are two proposed locations for the powerhouse, both located within the Whataroa Scenic Reserve. The powerhouse is a 5 metre tall metal clad building with a footprint of approximately 7 x 6 metres. It will be constructed approximately 5 - 10 metres above the normal water level and above the 100-year flood level. A gravel track will provide vehicle access to the powerhouse with sufficient space allowed for a turnaround area for service vehicles.

A transformer, approximately 2 metres tall with a footprint of 2.3 x 2.3 metres, will be built adjacent to the powerhouse and this will feed an 11 kV line to connect the scheme to the Westpower network. The powerline will be buried in a conduit beside the access road until it reaches the marginal strip where it will be installed on poles to interface with the Westpower system. A concrete tailrace will be constructed from the powerhouse to allow water to flow back into McCulloughs Creek. The paint colour palette suggested for the powerhouse and transformer is either dark grey or matt black.

4.6. Lower Catchment - Access Alignment.

A permanent 3.5 metre wide unsealed vehicle access track similar to a typical farm race will be constructed to connect to the Whataroa State Highway. The track will run parallel to the state highway for approximately 120m before turning right, where it will run parallel to McCulloughs Creek towards the Powerhouse for 300m through pasture, and then for another 400m through cleared indigenous vegetation. The forest type in this area is tutu forest, which is subject to regular natural disturbance through flooding therefore the overall disturbance is expected to be minor.¹⁴

4.7. Scheme Construction & Maintenance Methodology

If canopy trees are cleared and substantial gaps are opened up in the canopy this will cause a significant adverse effect on the indigenous landscape. The applicant will minimise damage to canopy vegetation during construction of the cableway, penstock pipeline, and foot access track by avoiding removal of trees >30 cm dbh.

It is understood that by employing low-impact methods for maintenance of the infrastructure (i.e. manual clearance of vegetation with hand tools and chainsaws, not mechanical excavation), the cableway and penstock will be installed without noticeable canopy gaps being created, with indigenous vegetation allowed to regenerate post-construction, therefore the canopy cover is likely to remain visually intact.

¹⁴ Hutchison M, McCaughan H, Patrick B. *Ecological Assessment for the Proposed McCulloughs Creek Hydropower Project, Whataroa, Westland. Wildlands*

Once construction is complete, maintenance of the penstock alignment should be similar to that required for a typical DoC route.

In addition to Appendix A - sheet A4 (Site & layout Plan) see also sheet A8 (Proposed Development Components) and Sheet A9 (Proposed Development Cross Section).

5. VISUAL CATCHMENT AND VIEWING AUDIENCE

5.1. Visual Catchment

Aside from the intake site which will be visible to the occasional backcountry hiker or hunter, the extent of visibility of the scheme will be limited to publically accessible views from the Whataroa Highway and the Whataroa River Valley. The visual simulations of the proposed scheme have focused on locations on SH6 which will experience the greatest visual impact.

5.2. Viewing Audience

The viewing audience is likely to consist of:

- Local residents; and
- Tourists and visitors to nearby attractions such as Franz Josef Glacier.

The views of the proposed development are likely to be from moving vehicles, local farm residences, cycle tourists and recreational users of the river.

Refer Appendix A - sheet A10 (Viewpoint Locations), and sheets A11 through A13 (Viewpoint Visual Catchments)

6. LANDSCAPE AND VISUAL EFFECTS

6.1. Overview

The extent of the visual catchment of the proposed development was investigated as a desktop exercise and then ground truthed by Bernie Ranum of Resilio during the site visit. Three representative viewpoints were selected.

6.2. Viewpoint 01_ Whataroa Highway SH6 - 43°15'58.62"S, 170°25'0.42"E

Viewing Audience

Local residents, tourists and visitors to nearby attractions with the viewpoint representing views from moving vehicles, local farm residences and cycle tourists.

Context

The view is taken from the Whataroa Highway adjacent to the entrance to the access track. The foreground includes the Whataroa Highway, alongside which the proposed access is to be located, approximately 750m from the proposed location of the powerhouse. There is a relatively small area of pasture enclosed by riparian vegetation to the north and forested mountains to the south. The middle ground has distributed shelter belts / specimen trees. The southern alps are to the east and north in the background of the view. The view will be the same during and after construction.

Landscape Character

A low density alluvial plain and rural landscape with high amenity resulting from the high natural character of the Whataroa River system and the thickly vegetated mountains enclosing the Whataroa River Valley.

Visual and Landscape Effects

The proposed development will introduce a new unsealed gravel track into the landscape and will be clearly visible in the foreground of the view. The track will be similar in style and scale to a typical farm race, in keeping with the existing rural character. As such, the proposed accessway will have a **low** effect on existing visual and landscape values.

Landscape Mitigation Measures

The materiality and colour of the access track will be the same or similar to other access tracks in the Whataroa landscape, which is of low reflectivity and in keeping with the local landscape character.

Summary of Effects

In summary, the effects on the visual and landscape character and values are **low**.

6.3. Viewpoint 02_ Whataroa Highway SH6 - 43°15'42.00"S, 170°25'7.92"E

Viewing Audience

Same as viewpoint 01.

Context

The view is from the Whataroa Highway looking directly up the McCulloughs Creek gully. The foreground includes the Whataroa Highway. The middle ground is composed of pasture with associated farm fences and gates with the edge of the McCulloughs Creek marginal strip

riparian planting adjacent the pastureland. The background of the view is characterised by densely forested steep mountain slopes.

Landscape Character

Alluvial plain and rural landscape with high amenity resulting from the high natural character of the thickly vegetated mountains enclosing the Whataroa valley.

Visual and Landscape Effects

The proposed development will introduce new constructed elements in a landscape with high natural value. During construction the cableway and support towers, laydown areas, clamp and cables will be partially visible through the vegetation. The most significant visual effect is likely to come from light reflecting off the support towers, clamp and cable, which will contrast with the natural character of the dense vegetative cover.

It is possible that the penstock pipeline, associated with the accessway and powerhouse will be visible through the vegetation during construction. However the scale and colour palette of the elements relative to the landscape context are small, discreet and in natural tones appropriate to the environment.

The lower slopes of the Adams Range visible on SH6 in the Whataroa River Valley exhibit regular patterns of disruption due to landslips, which occur on a frequent basis along this active fault line. Vegetation clearance anticipated during construction of the scheme will create a pattern of disruption that is of a much smaller scale than that which occurs naturally in this landscape.

Once construction is complete with the cableway removed, and the native vegetation has had a chance to regenerate, it is unlikely that the proposed development will be visible or will introduce any major landscape changes from this viewpoint.

The relative scale of the proposed development relative to the surrounding vegetation patterns mean the proposal will have **moderate** landscape and visual effects during construction and a **low** effects after construction from this viewpoint.

Landscape Mitigation Measures

In addition to the limited and careful vegetation removal (i.e. avoiding destruction of trees >30 cm dbh, and the appointment of an experienced arborist to undertake the removal) the recommended landscape mitigation measures for the proposed development are to ensure

that the colour and reflectivity of all materials and surfaces are of dark and recessive tones, such as matt black or dark grey, including the support towers, cableway and clamps.

Summary of Effects

In summary, the effects on the landscape character and values are moderate during construction and low after construction.

6.4. Viewpoint 03_ Whataroa Highway SH6 - 43°15'37.74"S, 170°25'12.48"E

Viewing Audience

Same as viewpoint 01.

Context

Same as viewpoint 02.

Landscape Character

Same as viewpoint 02.

Visual Effects

Same as viewpoint 02.

Landscape Effects

Same as viewpoint 02.

Landscape Mitigation Measures

Same as viewpoint 02.

Summary of Effects

Same as viewpoint 02.

7. ASSESSMENT OF LANDSCAPE AND VISUAL EFFECTS ¹⁵

- 7.1. A landscape is the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations. Landscape and visual impacts result from natural or human induced change in the distinctive combination of attributes that collectively give a landscape its character. Typically these changes result from modification to landform or vegetation cover and/or the introduction of new structures, activities or facilities into the landscape.

¹⁵ Assessment criteria from NZILA Best Practice Note: Landscape Assessment and Sustainable Management 10.1. November 2010

- 7.2. Landscape value is derived from the associative meanings and importance that people and communities, including mana whenua, attach to particular landscapes and landscape attributes. or ‘sense of place’ of an area.
- 7.3. Landscape effects include effects on natural features such as landform, vegetation and hydrology as well as impacts on infrastructure and settlement patterns, historic and cultural features as well as the overall character of the landscape.
- 7.4. Adverse effects upon landscape can arise when a landscape change is more than minor and/or imposes a discontinuity or discord with the existing and/or proposed (i.e. district plan outcomes) character and values. Visual and landscape effects both concern the assessment of changes to the landscape, however landscape effects include changes to the physical landscape that cannot be seen, but are otherwise understood to exist.
- 7.5. This assessment analyses the potential visual and landscape effects that may be generated by the proposal and is based on:
- The character and context within which the development would be viewed.
 - The proportion of the proposal, including building, earthworks and access that will be visible.
 - The observer’s position relative to the landscape and objects being viewed.
 - The number and type of viewers and their location in relation to the site.
 - The sensitivity to which the character and values of a particular landscape are susceptible to change.
 - The vulnerability to which the landscape character and values are at risk from a particular type of change.
 - The potential to avoid, remedy or mitigate those changes that are deemed to be more than minor.
 - The timeframes associated with the change and the establishment of any mitigation measures such as planting over the short term, medium term and long term.

7.6. [Visual effects and landscape values rating scale](#)

The below eight-point scale is used to describe effects: ¹⁶

¹⁶ *Defined and Agreed at NZILA Assessment Methodology Workshop, Part of a National Roadshow Facilitated by Retired Environment Court Judge Gordon Whiting. Results Currently Being Compiled.; 2017*

- **Very High:** Total loss to the key attributes of the receiving environment and/or visual context amounting to a complete change of landscape character
- **High:** Major change to the characteristics or key attributes of the receiving environment and/or visual context within which it is seen; and/or a major effect on the perceived amenity derived from it.
- **Moderate-High:** A moderate to high level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate-high level of effect on the perceived amenity derived from it.
- **Moderate:** A moderate level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Moderate: adjective-average in amount, intensity or degree).
- **Moderate-Low:** A moderate to low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate to low level of effect on the perceived amenity derived from it.
- **Low:** A low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a low level of effect on the perceived amenity derived from it. (Oxford English Dictionary Definition: Low: adjective-below average in amount, extent, or intensity).
- **Very Low:** Very low or no modification to key elements/features/characteristics of the baseline or available views, i.e. approximating a 'no-change' situation.

8. ASSESSMENT AGAINST RELEVANT STATUTORY CRITERIA

8.1. The key themes addressed in the statutes of relevance to an assessment of landscape and visual effects for this site can be summarised as follows:

- Maintain, protect and preserve the:
 - Outstanding natural landscapes from inappropriate subdivision, use, and development (RMA, WDP, CMS)
 - Natural character (RMA), values (CA marginal strip), and environment, or landscape (SR, CMS, WDP);
 - Scenic interest, beauty (SR, WDP), amenity value, viewfields and visual appeal (WCRPS, CMS, GCP);
 - Distinctive character and sense of identity (WCRPR, CMS, GCP); and
 - Character dominated by natural dynamic processes (WDP, CMS, GCP).
- Any adverse effect of development does not impinge on the integrity of the landscape (WDP) and where development does occur it has regard to the natural landscapes in which they are located and avoids, remedies or mitigates any adverse effects (WDP, WCRPC, GCP)
- Provision for, and protection of, public access to the countryside (RA) and recreational values (WCRPR)

8.2. Maintain, protect and preserve the character of the landscape, including outstanding natural landscapes

The assessment of landscape and visual effects demonstrates that the proposed development will undoubtedly introduce a change to the landscape, however, it is regarded that once construction is complete the changes will not adversely alter the natural character of both the visual and landscape values of the area. While there will be some moderate to low adverse visual and landscape effects during construction, these will be of a temporal nature of up to one years duration. The two cases which deserve additional explanations are the encroachment into the ONL, and the access track along the marginal strip.

As noted above, the water intake and sections of the penstock pipes, access tracks and cableway will be located higher than 300m above sea level, meaning they will pass through an area identified in the Westland District Plan as an ONL. With careful and sensitive alignment design and materiality choice the visual effects of most components of the project, such as the penstock pipes and access tracks, are likely to be negligible; however, the visual effect of the cableway, in particular the support tower above 300m elevation, will be moderate-low during construction. The primary effect will arise from the introduction of a man made material into a landscape with high natural character, especially if the support towers were to extend above the canopy line. The Supplementary Ecological Report states that the applicant has used aerial mapping to assess tree height, cross sections of the site indicate that the towers will be within the tree canopy height.

The mitigation strategies proposed, especially the limited vegetation removal in particular, suggest that the pipeline alignment will be supervised and refined during installation to professionally monitor significant tree pruning or removal, and the use of dark and recessive tones of all introduced materials, will ensure that any visual effects on the landscape will be minimised. This in combination with the temporary nature of the construction activity mean that the character and values of the landscape, including outstanding natural landscapes, will be maintained and protected.

As described above, the first 420m of the access track will be visible from the Whataroa Highway and will run through the marginal strip of McCulloughs Creek. The access track is considered appropriate for the following reasons:

- The visible section of the access track passes through modified pasture and is of a character analogous to a farm access track; and

- The marginal strip is within a floodplain, which reflects a dynamic processes of disturbance resulting from regular flooding. The access track does not fundamentally alter this underlying dynamic process.

While the scheme is likely to be visible during construction from the Whataroa Highway and parts of the Whataroa River Valley, the limited visibility (including the number of places the development is visible from; the visibility of the development itself; and the nature of viewing the scheme from a moving vehicle) and the temporal nature of any potential visual effects, combined with the proposed mitigation strategies to lessen the visual impact of steel structures mean that the effects on the *natural character, natural values, the natural environment, intrinsic values of landscape, scenic interest, beauty, amenity value, visual appeal, distinctive character and sense of identity* will be **low**.

8.3. Public Access + Recreational Values

As noted above, part of the proposed development involves the creation of a 2.7km long access track, *similar to a DoC route*, from the powerhouse through to the intake site approximately 520 metres above sea level. The access track will be mainly used to cater for contractors undertaking required construction, routine maintenance and monitoring checks. However, it is also proposed that the track/route will be open to the local community and provide access into Whataroa Scenic Reserve and Waitangi Forest.

It is recommended that the access track be required to be planned, designed and constructed according to DoC Track Construction and Maintenance Guidelines VC1672 surrounding a 'route' and meet Track Service Standards (SNZ HB 8630:2004).¹⁷ This will provide another level of certainty that the track/route will be appropriately scaled, constructed and maintained minimising vegetation damage and kept within the landscape character of the surrounding scenic environment.

In providing public access into Whataroa Scenic Reserve and Waitangi Forest the proposed development will be giving effect to a core intent of the Reserves Act "*to make provision for public access to the coastline and the countryside*" and the Westland District Plan which seeks to make the "*dramatic coast-to-alpine environment and vistas... accessible for the enjoyment of both inhabitants and visitors.*"

¹⁷ SNZ HB 8630:2004 *New Zealand Handbook Tracks and Outdoor Visitor Structures*. October 2003

9. CONCLUSION

- 9.1. In conclusion, the proposed hydropower scheme will see the introduction of several man made artifacts into a site defined by the alluvial floodplain associated with the Whataroa River system and McCulloughs Creek, and a steep ridgeline and gully system covered in dense native forest. The alluvial plain consists of a low density rural landscape with high amenity resulting from the high natural character of the Whataroa River system and the thickly vegetated mountains enclosing the Whataroa valley

The proposed development will be visible during construction with the vehicle access track being the only permanent visual record of the development from the Whataroa Highway and surrounding river plain once development is complete and when vegetation recovery has taken place. The scale and temporal nature of the proposed development could have some moderate-low visual and landscape impacts during construction however these will be of a temporal nature and the enduring visual and landscape effects of the proposed development will be low.

- 9.2. The assessment of the visual and landscape effects demonstrates that the proposed development will be **low to moderate** during construction and **low** after construction.

Bernie Ranum | Landscape Architect



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